

As I am a mere tyro myself, and therefore unbiassed in the matter, I beg leave to state, for the benefit of any whose acquaintance with the subject is of only a rudimentary nature—or less—what appears to be a reasonable explanation of the case.

1. The implements of foremost scientific interest are probably those which are found in the various well-known caves, in that they retain in the highest degree all the original sharpness of edge possible only under the slow and undisturbed circumstances of the formation of the stalagmitic rock, or silt deposit, in which they have become embedded above the surface of the ancient floor. All such specimens bear clear and unmistakable testimony to their nature and use as weapons.

2. The alternative hunting-grounds for flint implements are the wide-spread gravels which formed the beds and older banks of the ancient rivers, and which have been of late so thoroughly explored by Mr. Worthington Smith, as recorded by him in this journal, in so many interesting and valuable communications. Respecting these it is only natural that in some cases the specimens have been subjected to much detrition; but then a special value attaches to them on that very account. Of the river gravels as localities from which such evidences are obtainable it is quite unnecessary for me to use space in emphasising the importance of river-sides as a habitat of primitive man.

3. "The entire absence of the bones of man," is simply due to the rapid decomposition of the osseous frames of small-boned animals, and the speedy annihilation of which in the case of man—cremation and other means of disposal apart—is particularly noticeable.

Perhaps the position will be best understood by suggesting the question, "Do you imagine it at all probable that you could unearth any trace of a single bone of one of your pedigree ancestors, say only your great-great-grandfather?" If any of you should doubt the impossibility of such a thing, let proof be given by employing the first grave-digger—out of "Hamlet"—to bring the treasures to the light of day, and let the facts of the case be placed on careful record.

4. Any connoisseur can at once tell by the touch of a flint flake whether it has been worked or not, and the fracture always bears certain signs by which the operation may be known to have been performed.

It is somewhat remarkable that there should be any so faithless as to seek after signs so easily to be discerned, in opposition to the testimony of reliable authorities; and it is surely time that surrounded as we are with national museums and libraries full of patent facts appealing to all who cannot work for themselves, we should cease to throw discredit upon the evidence of many careful observers and honourable truth-seekers.

Highbury

WM. WHITE

YOUR correspondent, Mr. C. Evans, raises the question, in your issue of November 2, whether the peculiarly-chipped flint found in the palæolithic gravels, and accepted as the work of man, may not be the result of natural causes.

Mr. Evans mentions "the presence of bones of recent and extinct Mammalia." If your correspondent has clear evidence of the presence of bones of recent mammalia with the chipped flints that evidence would prove that the flints in question have not been so chipped by Palæolithic man, but are either nature's work, or the product of man of more recent times, and the gravels in such case should not be called Palæolithic gravels.

St. John's Wood, November 7

T. KARR CALLARD

Aurora

A MAGNIFICENT aurora was observed here last night. I first detected quivering sheaves on the northern horizon about 5.40 G.M.T. About 5.47 a dull indigo base, on or against which "sheaves" and "streamers" were playing with great beauty, was noted, surmounted by an arch of light. Soon afterwards, sharply-defined "spines" and "spikes" of great brilliancy and in patches became developed, followed by five great tongues of light stretching towards the zenith. I especially noted streamers reaching towards Vega, and passing over Mizar in Ursa Major, and some of exceptional brilliancy to north-north-east. At 6.50 irregular horizontal belts of a dull indigo tint, alternated with horizontal tongues of light, the streamers having generally disappeared, except to north-north-east. At 8.6 p.m. a low indigo belt, surmounted by a bright golden band, fringed the horizon, o'ertopped again by belts of paler tints respectively, while 72-

attached brilliant streamers shot up fitfully towards Cassiopeia. At 11 p.m. auroral lights were still seen.

To-day I intend to examine the sun's disc, and expect to see signs of disturbance.

Fort William, November 14

CLEMENT L. WRAGGE

A Dredging Implement

I WAS much interested in reading, in the last number of NATURE, Prof. Milnes Marshall's account of his successful trial of a new dredging implement.

A few summers ago I constructed and used in Lamlash Bay, Arran, a somewhat similar machine, suggested, like Prof. Marshall's, by the Philippine Islander's dredge used in the *Euplectella* fishery. My implement was a rough copy of one brought from Cebu which I had seen at the *Challenger* office in Edinburgh. It had two slight wooden bars, 5 or 6 feet each in length, meeting at about a right angle to form the front of the apparatus, and having several cross-pieces connecting them further back. I attached large fish-hooks, not to cords hanging from the frame, as in Prof. Marshall's instrument, but to the long bars themselves (as in the Philippine Islanders' machine), and also to the cross-pieces. One weight was tied to a cross-piece near the centre of the frame-work, and a second was attached to the rope a few feet from the front of the instrument, so as to make the pull more horizontal, and so prevent the front end from tilting upwards.

The apparatus worked well and brought up quantities of Hydroids and Polyzoa; but as I was not dredging for Giant Pennatulids, after a few trials I gave it up and returned to the ordinary naturalist's dredge. In one case, however, I found my fish-hook apparatus serviceable. I wished to search a remarkably sea-weedy region, in a few fathoms of water, chiefly for Ascidians attached to the sea-weeds. The ordinary dredge I found almost invariably soon after reaching the bottom, got foul of a large *Laminaria* or some other Algæ, which stretched across the mouth and prevented anything entering. The frame-work with hooks, on the other hand, always brought up enormous masses of stuff, in many cases dragging the *Laminaria* up by the "roots," and hoisting also sometimes stones and shells to which the Algæ were attached, and on which were very frequently the Ascidians I was in quest of.

I should think this kind of apparatus would be most useful for obtaining Algæ on rocky ground, and its value in dredging Pennatulids is sufficiently shown by Prof. Marshall's experience at Oban.

W. A. HERDMAN

University College, Liverpool

Forged Irish Antiquities

UP to the present we have had little reason to complain of forgeries among Irish antiquities. Shams have frequently been offered for sale, but they could scarcely be called forgeries, as they were so unlike genuine articles that persons of ordinary experience could scarcely be deceived by them. Lately, however, some very clever imitations have come under my notice. The objects imitated are those known as oval tool-stones, which were formerly very rare but are now offered in lots of two or three together. I believe the fabricated articles are produced somewhere about the Giant's Causeway, the ordinary black shore pebbles being used for the purpose.

W. J. KNOWLES

Flixton Place, Ballymena, November 11

THE NEW NATURAL HISTORY MUSEUM

SINCE our previous notice of the great building which has been erected at South Kensington for the reception of the Natural History Collections of the British Museum (NATURE, vol. xxiii. p. 549, April 14, 1881), eighteen months have elapsed, and during that period great progress has been made in the transfer and arrangement of specimens. It may not be uninteresting to the readers of NATURE to receive some information concerning the present condition of affairs and the prospective arrangements in connection with the housing and exhibition of the priceless treasures of the national collections.

The first point which strikes a visitor at the present time is that a serious mistake has been made in the erec-

tion of a building with such elaborate and ornate internal decorations for museum purposes. Now that the cases are nearly all in position and the specimens are gradually being arranged in them, this incongruity between the style and objects of the building becomes more and more apparent. On the one hand, it is clear that the form, position, and illumination of the cases has in many instances been sacrificed to a fear of interfering with the general architectural effect; and on the other hand it is equally manifest that it will be impossible to make full use of the floor space, and especially the best-lighted portion of it, without seriously detracting from the artistic effects designed by the architect.

Thus we find the beautiful arcade formed by a series of pierced wall-cases in the Coral-gallery has its effect totally destroyed by the floor-cases, which it has been found necessary to place along the central line; and in the British gallery the vistas designed by the architect have been completely marred by the insertion of large cases in some of the arches. Again and again we find massive columns, beautiful in themselves perhaps, breaking up a line of cases, or throwing their contents into deep shade. The peculiar tint of the terra-cotta, too, is far from being suitable for making the objects of the Museum stand out in relief, and this is particularly manifest in the case of the palæontological collections, where a great majority of the specimens have a very similar colouring. When an attempt has been made to remedy this by giving the walls near the objects other tints; it is found that such tints do not harmonize well with the general colouring of the building. Nor is the wisdom apparent of bringing into close proximity natural-history objects with the conventional representations of them adopted by architects. The crowding together, on the same column or moulding, of representations on the same scale of microscopic and gigantic organisms, of inhabitants of the sea and of the land, and of the forms of life belonging to present and those of former periods of the earth's history, seems to be scarcely warrantable in a building designed for educational purposes.

Greatly as we admire the spacious hall, the grand staircase, the long colonnades, and the picturesque colouring of the whole building, we cannot but feel that the adoption of such a semi-ecclesiastical style was a mistake. We fear that in the future there will be a perpetual conflict between the views of the keepers of the Museum-collections and those of the architect of the building; for the erection of cases as they may be required in the most convenient and best-lighted situations cannot fail to detract from the striking and pleasing effects of the architecture.

Apart from this fundamental objection, however, we find nothing but what is praiseworthy in the arrangements which are being made to worthily exhibit to the public these grand collections, of which such large portions have been long buried at Bloomsbury. In a few months the whole of them will have been removed from their old places of exhibition (or more often of sepulture) to the new galleries, where the space available for their arrangement is so much greater. The cases in the Zoological Galleries are now almost completed and fitted, and the collections of osteology and shells with some of the stuffed animals, have been already removed to their new home—so that the public may hope to see the transfer of the whole of the specimens completed by next spring.

The keepers of the geological, mineralogical, and botanical collections, which are housed in the eastern wing and annexes of the building, have had a very difficult task to perform. They were called upon to remove these collections before the fitting of cases in the new buildings was completed, and in consequence of this the re-arrangement of the specimens, with the incorporation of the valuable material long packed away in the cellars at Bloomsbury owing to want of space, was rendered additionally laborious and troublesome. These diffi-

culties have now, for the most part, however, been happily overcome.

The Geological collections, in spite of their vastness have been to a great extent arranged. The Mammalian and Reptilian Galleries are indeed almost completed, and much progress has been made with the Fish Gallery and the several rooms devoted to the exhibition of the invertebrata and the stratigraphical collections. The trustees have been fortunate in securing the services of such an experienced palæontologist as Mr. Etheridge to second the energetic efforts of Dr. Woodward in this department. By the insertion of drawings and tables, illustrative of the structure and classification of the fossil forms, the value of this part of the collection to students has been greatly enhanced.

In the Mineralogical Gallery everyone must be struck by the improvement in the cases, now that the specimens are no longer crowded together, as was the case in the old museum. At the end of the general gallery, and in the adjoining pavilion, there are a number of interesting special collections. First and foremost among these is the unrivalled series of meteorites, which is now displayed to much greater advantage than at Bloomsbury; with these are collections of crystals, both artificial and natural, of pseudomorphs and of rocks, or mineral aggregates—the latter being an entirely new feature in this department. Large specimens, illustrating the abnormal development, the mode of association, and the economic uses of minerals are here being arranged, and they make a very fine display. Working mineralogists will be thankful to Mr. Fletcher for his capital design of setting apart a case, in which new acquisitions to the collection are exhibited for awhile, before being incorporated with the general series.

The portion of the Botanical collection available for public exhibition is small, but Mr. Carruthers, the keeper, has brought together a capital series of examples of all the great divisions of the vegetable kingdom—illustrating the dried specimens, where necessary, by drawings and models.

There are two points, however, in connection with the establishment concerning which the readers of NATURE will naturally be especially desirous of information—first, as to the facilities to be afforded to students for examining the valuable types and rare specimens in which the collections are so rich, and secondly, with respect to the improvements which are sought to be made in the Museum, regarded from the point of view of an educational institution. The surest test of the efficiency of the administration of such a museum as this will be found in the manner in which these two great objects are attained by its keepers.

Close days for students having been now entirely abolished, the trustees of the Museum have provided galleries in each of the departments where scientific workers can pursue their studies undisturbed. We cannot help thinking that this plan is far better than the old one, which required original investigators to attend on those days of the week when the public were not admitted to the galleries—a restriction keenly felt by busy men in this country, and more especially by foreigners, who had perhaps come to this country with the sole object of devoting their time to the study of our national collections. As there are valuable reference libraries in each of the departments, and a general library of scientific journals for the whole establishment, the student has much greater facilities than formerly for carrying on his work, and nothing can exceed the courtesy with which persons actually engaged in scientific research are received and aided by the keepers and their assistants.

The publication of the series of well-known and valuable scientific catalogues is still proceeding. During the pressure of work caused by the removal of these vast collections, the trustees of the Museum have done wisely

to avail themselves of the aid of specialists from outside, in connection with certain of the collections. Thus the collection of the fossil foraminifera has been arranged by Prof. T. Rupert Jones, whose catalogue of the same has been recently published. Dr. Hinde has in the same way dealt with the grand collection of fossil sponges; and his illustrated catalogue of them is now in the press.

But while the purely scientific objects of the Museum are not being lost sight of, we are glad to find that the greatest efforts are being directed by the keepers to the development of the institution as a means of popular education. In addition to the three admirable guides, published at the low price of one penny each, other popular works in illustration of the collection are being prepared. Thus Mr. Fletcher has written a penny guide to the collection of meteorites, in which he has drawn up one of the best statements concerning the nature of these bodies, and of the grounds on which they are so greatly valued by scientific inquirers, that we ever remember to have read. Simple in its language and mode of treatment of the subject, this little guide is replete with the most valuable information—information which the student of the collection might ransack a library in vain to find.

Still more interesting is Dr. Woodward's venture in the same direction—an illustrated guide for the department of Geology and Palæontology. The woodcut illustrations of this work are in part original, and in part borrowed from various scientific manuals, the publishers of which have generously granted the use of them to the Museum authorities. By the aid of these woodcuts Dr. Woodward is able to call attention to the chief facts concerning the structure of some of the most remarkable fossils in the collection, and the guide forms an excellent introduction to the study of palæontology. At present the only part of this guide which is illustrated by woodcuts is that which deals with the fossil vertebrates, for these only are as yet fully arranged; but in subsequent editions, no doubt, Dr. Woodward will give equal attention to the description of the most important forms, among the invertebrates. The design is an excellent one, and there is every promise in the present instalment of the work of its being admirably carried out. Such work cannot fail to be the means of diffusing in the widest possible manner accurate notions on the subject of natural history among the people. We hope that its circulation may be as large as that of Prof. Oliver's admirably illustrated guide to Kew Gardens, which we are glad to see has passed through twenty-nine editions.

While on the subject of the means adopted by the Museum authorities to make the collections a means of diffusing correct ideas among the people, we cannot avoid referring to Prof. Owen's design of surrounding the great central hall of the building with an "Index Museum." The idea is most praiseworthy, but its execution will, we fear, be attended with serious difficulties. Prof. Owen proposes to devote the first of the six recesses on the western side of the central hall to the illustration of man, the two next to the other mammalia, the fourth to birds, the fifth to reptiles, and the sixth to fishes. On the other side three recesses are to be devoted to the invertebrata, and one each to botany, mineralogy, and geology. Few naturalists will agree with Prof. Owen that the points which distinguish man from the rest of the animal kingdom, are to the zoologist, of such importance as to necessitate the setting apart of a division of the Index Museum for their illustration; and the limited portion of the available space assigned to botany and geology will occasion much surprise. As structural alterations have interfered with the use of two of these recesses, and the lighting of some of them is far from being satisfactory, the project may perhaps have to be greatly modified. One of the recesses, that devoted to the birds, has been already arranged with instructive diagrams and well-selected specimens, and a penny guide

to it, written by Prof. Owen in his well-known clear and attractive style, has been published. If the design is carried further, we hope the greatest care will be taken to make the classification and arrangement adopted in the Index Museum harmonise with that employed in the several galleries, for otherwise such a museum will not serve as an index to the great collection, but will be a source of confusion rather than of assistance to students.

Of the zoological collections we can say little at present. The birds will occupy the ground floor of the western wing of the building, and the mammals the floor above. The osteological collections belonging to these two departments are already arranged in the upper floor, and form a new and most valuable feature of the Museum. The articulated skeletons are exhibited on the floor and in glass cases, behind which cupboards are constructed for the reception of unarticulated skeletons. The Pavilion contains a special series of bones, which are reserved for purposes of study. The skeletons of whales are to be housed in the basement of the building.

Generally we find that the convenience of the public has been fully consulted in the arrangements of the building. The lavatories and cloak-rooms are all that can be desired, but we suspect that much disappointment will be felt with regard to the refreshment department as at present constituted. Small and inconvenient counters are being erected on the highest story of the building, outside the Botanical and Osteological Galleries respectively. The obstacle thus created to the ingress and egress of visitors to those departments, and the fact that mice will infallibly be brought to them, is enough to ensure condemnation of such a plan. We hope that the trustees may yet reconsider the question, and find themselves able to devote to the purpose of refreshment, a room in the building which is centrally situated, and at the same time entirely cut off from the collections.

THE COMET

WE take the following from the *Sydney Morning Herald* of September 19:—

Mr. H. C. Russell, Government Astronomer, sends us the following interesting particulars respecting the comet, under yesterday's date:—

The comet discovered on the 7th has developed in brilliance rapidly. When I first saw it on the 8th, the nucleus was equal to a bright star of the second magnitude; by the 11th it was brighter than a first magnitude star, and I was able to see it for eight minutes after sunrise on that day. Subsequently, the mornings were cloudy, and I could not see the comet either then or during the daylight, probably because of the sea haze, which is more or less part of the N.E. wind. The comet has, however, increased in brilliance so rapidly that Mr. Ellery was able to see the comet at noon, and telegraphed to me to that effect, and the air being clear it was found at once. I had not anticipated such a wonderful increase in its light, for now it is easily seen in the full glare of the sunshine, like a star of the first magnitude, even when viewed without a telescope, and it must be many times more brilliant than Venus when at maximum. In the large telescope the nucleus appears round and well defined, and measured three seconds in diameter; from it, extended on each side, the first branches of the coma, like two little cherub wings, and in front, the great body of the coma, forming a brilliant and symmetrical head, and thence turning to form the tail six minutes long. Under close scrutiny it was evident that the coma had one or more dark bands, curved like the outline, which made the form very interesting, but the glare of the sunlight made it very trying to the eyes. It is a splendid object, and it is to be regretted that no stars can be seen by means of which to fix